

CLAIMS

What is claimed is:

5 1. A microbolometer sensor comprising:

a first cantilever supported above a substrate and formed of a bimaterial so as to deform in a first direction in response to incident radiation;

10 a second cantilever supported above said substrate and formed of a bimaterial so oriented as to cause said second cantilever to deflect oppositely to said first cantilever in response to radiation;

15 said first and second cantilevers having a spacing therebetween which varies as a function of radiation incident on said first and second cantilevers; and

means for sensing the deflection of said first and second cantilevers to provide an indication of the incident radiation.

20 2. The sensor of claim 1, wherein said first and second cantilevers include multiple vanes supported so as to at least partially overlap.

25 3. The sensor of any previous claim, wherein said first and second cantilevers extend above said support substantially parallel to each other.

4. The sensor of any previous claim, wherein said cantilevers are coated to absorb said radiation.

30 5. The sensor of any previous claim, wherein said cantilevers include layers of Al and SiNx to provide opposite deflection in response to radiation.

6. The sensor of any previous claim, wherein said cantilevers and said substrate define a quarter wave cavity.

7. The sensor of any previous claim further including a 5 plurality of said cantilevers in any array.

8. The sensor of any previous claim, wherein said means for sensing deflection includes means for sensing a capacitance between said cantilevers.

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9. The sensor of any previous claim further including a coating on at least one of said cantilevers to provide thermal isolation therebetween.

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10. The sensor of claim 9, wherein said coating is a layer of NiCr on a side of at least one cantilever facing the other said cantilever.

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11. The sensor of any previous claim wherein said radiation is IR radiation.

12. A process for forming the sensor of any previous claim using micromechanical procedures.

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13. The process of claim 12, further including the steps of forming one or both of said cantilevers on a sacrificial layer and subsequently etching away said sacrificial layer.

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14. The process of any one of claims 12 and 13, further including the step of forming said cantilevers from supports having footings buried in said substrate and wherein said substrate is silicon.

15. The process of any one of claims 12 through 14, further including the step of forming at least a portion of said sensing means on said substrate.

5 16. A process of forming a micromechanical cantilever structure, comprising:

forming said cantilever on a sacrificial layer and subsequently etching away said sacrificial layer;

10 irradiating said cantilever with an ion beam, whereby said cantilever is flattened.

17. The process of claim 16, further comprising annealing said cantilever at a temperature selected to further flatten said cantilever.

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